

Reconsideration of the above-identified application is requested in view of the following remarks.

### **REMARKS**

#### ***Status of the Claims***

Claims 1, 4, 7, 10, 16 and 20 have been amended without prejudice to or disclaimer of the subject matter therein. These changes are believed to introduce no new matter.

Specifically, amendments to claims 1 and 10 find support, *inter alia*, in the specification at page 5, lines 29-30, and in claims 6 and 15 as originally filed.

Claims 4 and 7 find support, *inter alia*, in the specification at page 5, lines 17-18.

Claim 16 finds support, *inter alia*, in claim 14 as originally filed, from which original claim 16 depended.

Claim 20 finds support, *inter alia*, in claims 17 and 20 as originally filed.

Claims 5, 6, 14 and 15 have been cancelled without prejudice to or disclaimer of the subject matter therein.

Claims 1-4, 7-13, and 16-20 are pending, with claims 1 and 10 being the independent claims. Claims 1-20 have been rejected.

Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn.

***Objection to the Specification***

The Examiner has rejected to the specification stating, “the term substantially substrate free is defined as containing 60% or less substrate,” concluding, “[t]his range would not be considered as substrate free.” See Office Action at page 2, section 1.

Applicants traverse this objection.

The Applicants have the right to define and claim their invention as he chooses. See MPEP §2173.01. As the Examiner points out, Applicants have defined “substantially substrate free” in the specification as meaning “less than about 60 weight percent of substrate based on the total weight of the effect pigment.” Specification at page 4, lines 20-21. One of skill in the art would understand what is meant by substantially substrate free in light of the specification. Nevertheless, in the interest of furthering prosecution Applicants have amended the specification to recite the phrase “‘substantially substrate-free’ means containing less than about 20 weight percent of substrate based on the total weight of the effect pigment.” Support for this amendment to the specification can be found, *inter alia*, in the specification at page 5, lines 29-30, and in claims 6 and 15, as originally filed. Thus, this objection has been rendered moot and Applicants respectfully request withdrawal of this objection.

***Rejections under 35 U.S.C. § 112, paragraph 2***

Claims 1-20

The Examiner has rejected claims 1-20 under 35 U.S.C. §112, second paragraph, stating, “Applicant defines the term ‘substantially substrate free’ as containing 60% or less substrate, this range would not be considered as substrate free. The term

‘substantially’ may be acceptable as long as it does not negate the meaning of the word it modifies as in this case.” See Office Action at page 2, section 4. Applicants respectfully traverse this rejection.

As Applicants have previously pointed out the phrase “substantially substrate-free” is defined in the specification as “less than about 60 weight percent of substrate based on the total weight of the effect pigment.” Specification at page 4, lines 20-21. Applicants have the right to define and claim his invention as he sees fit. See § M.P.E.P 2173.01. However, in the interest of furthering prosecution, Applicants have amended claim 1 and claim 10 to include the limitation “containing less than about 20 weight percent of substrate based on the total weight of the effect pigment.” As amended, Applicants assert that the phrase “containing less than about 20 weight percent of substrate” would be well understood by one of ordinary skill in the art. Applicants respectfully request that the Examiner reconsider and withdraw the rejection.

#### Claims 4 and 7

The Examiner has rejected claims 4 and 7 under 35 U.S.C. §112, second paragraph. According to the Examiner, “the phrase ‘titanium dioxide in the area other than the surface is in the rutile crystalline form’ and ‘titanium dioxide in the area other than the surface is in the anatase crystalline form’ are vague and confusing. The titanium is not reported in any area other than the surface.” See Office Action at page 2, section 5.

Applicants have amended claim 4 to recite “the effect pigment of claim 1 wherein said titanium dioxide is in the rutile crystalline form.” See claim 4. Similarly, Applicants have amended claim 7 to recite “the effect pigment of claim 3 wherein said titanium

dioxide is in the anatase crystalline form.” See claim 7. Support for these amendments can be found in the specification at page 5, lines 17-18. As such, Applicants assert that claims 4 and 7 are not vague and confusing. Applicants respectfully request reconsideration and withdrawal of these rejections.

Claim 16

In regard to the limitation “the mica” on claim 16, the Examiner states, “[t]here is insufficient antecedent basis for this limitation in the claim.” See Office Action at page 3, section 6.

Applicants wish to thank the Examiner for pointing out this unintentional error. Applicants have amended claim 16 to correct the antecedent basis of the claim. Thus, this rejection has been rendered moot and withdrawal thereof is respectfully requested.

Claim 20

The Examiner states that claim 20 is indefinite and inquires “[w]hat is meant by a paint comprising paint?” See Office Action at page 3, section 7.

Again, Applicants wish to thank the Examiner for pointing out this unintentional error. In order to clarify claim 20, Applicants have amended claim 20 to recite “An automotive paint including a pigment, wherein said pigment is said effect pigment of claim 1.” Thus, this rejection has been rendered moot and withdrawal thereof is respectfully requested.

***Rejections under 35 U.S.C. § 103(a), as unpatentable over DeLuca et al. and Schmid et al.***

The Examiner has rejected claims 1, 4-10, 12-15, and 17-19 under 35 U.S.C. 103(a) as being unpatentable over DeLuca et al. U.S. Patent No. 5,611,851 and Schmid et al. U.S. Patent No. 5,693,135. Applicants respectfully traverse this rejection.

According to the Examiner, “DeLuca teaches a process for preparing unsupported metal oxide nacreous pigments derived from metal oxide coated mica pigments wherein mica is dissolved away from rutile or anatase titanium dioxide (col. 2, line 47-col.4, line 41) by dispersing the pigments in a phosphoric-sulfuric acid solution (col. 2, lines 57-60).” The Examiner further contends, “Schmid teaches a reduced titanium oxide coated mica and method of making wherein titanium dioxide is reduced in the presence hydrogen or ammonia or mixtures of the two, which can produce mass tone colors of blue to violet (col. 3, lines 1-35; Examples 1 and 2).” See Office Action at pages 3-4, section 9.

The Examiner concludes, “[i]t would have been obvious to one of ordinary skill in the art to combine the two inventions, DeLuca’s invention of the unsupported metal oxide for the purpose of increasing the reflectivity and Schmid’s invention of reducing the metal oxide for the purpose of increasing the mass tone color, in order to produce an optimum optical effect pigment having increase reflectivity and deep mass tone color.” See Office Action at pages 4, second paragraph. Applicants traverse this rejection.

Claims 1 and 10

The interference pigments of the present invention contain improved characteristics over those of the prior art. More specifically, the pigments of the present invention show increased optical thickness, improved hiding ability, and a color change when compared to the pigments of the '851 and '135 patents. According to the specification:

... the pigments of this invention are significantly different in that they are substantially substrate-free (as defined below) and unexpectedly maintain their high degree of color purity and reflectivity through the color spectrum of gold to green following the reduction treatment. Before the present invention, it was observed that the color and brilliance were lost as the degree of reduction increases, especially with mica-based pigments, to the extent that interference quality was compromised. However, when employing the self-supporting or platy  $\text{TiO}_2$  of the present invention, this quality loss is negligible, resulting in a product with high opacity, excellent color, and reflectivity. In addition, and even more unexpectedly, the pigments of this invention not only maintain their original interference look but actually appear to advance in optical thickness as the reduction process intensifies. Thus, e.g., a self-supporting yellow  $\text{TiO}_2$  will move from yellow to deep gold to olive green. By controlling the degree of titanium dioxide reduction, various dark absorption shades can be obtained without compromising reflection or color purity. Thus, an interference effect pigment with a dark absorption color of superior reflection and color purity can be achieved or the reduction can be carried out so that the resulting color pigment is completely opaque with a metallic look.

See Specification at page 3, line 22, through page 4, line 10. In support of these superior characteristics and unexpected results, Applicants submit herewith the Declaration of Carmine DeLuca, a co-inventor of the present invention, under 37 C.F.R. §1.132. Please note that the Exhibits A-C mentioned in the Declaration are the original drawdown cards.

Submitted herewith are color copies of original Exhibits A-C, referenced in the Declaration of Carmine DeLuca. The undersigned attorney plans on bringing original Exhibits A-C in to an interview that will shortly be arranged with the Examiner. The Rule 132 Declaration shows a comparison of supported reduced and unsupported reduced pigments (Exhibit A), as well as comparisons of reduced and non-reduced unsupported pigments (Exhibits B and C), on drawdown cards (see Declaration paragraphs 5-7). In paragraph 9 of the Declaration, the co-inventor states that the pigment of present invention formed by reducing a substantially substrate-free titanium dioxide pigment shows an unexpected change in color. For example, the co-inventor states in paragraph 5 of the Declaration that an unsupported reduced pigment of the present invention (WH-434), when compared to a supported reduced pigment (WH-468), demonstrates a color change from a dull green to a dark olive green. The resulting color change is unexpected in light of the teachings of the prior art (see Declaration paragraph 9), and thus, nonobvious. Furthermore, the co-inventor states in paragraph 7 of the Declaration that an unsupported reduced pigment of the present invention (WH-507), when compared to an unsupported non-reduced pigment (WPK 96058), demonstrates a color change from light-green to a blue-green or gray color. Again, this color change is unexpected in light of the prior art (see Declaration paragraph 9), and thus, nonobvious. In addition to this unexpected color change, the pigments of the present invention also show an increased optical thickness resulting in improved hiding ability. This improved characteristic in the pigments of the present invention result from the color change, and thus, were also unexpected.

Therefore, it is Applicants position that the reduced unsupported pigments of the present invention not only contain improved characteristics, such as increased optical thickness, improved hiding, and a color change, but also that these characteristics are unexpected in light of the teachings of the '851 and '135 patents. As such, Applicants assert that the present invention would not have been obvious to one of ordinary skill in the art. See M.P.E.P § 716.02. Thus, Applicants respectfully request reconsideration and withdrawal of this rejection.

Claims 4, 7-9, 12-13, and 17-19

The Examiner has rejected claims 4, 7-9, 12-13 and 17-19 under 35 U.S.C. § 103(a) as being unpatentable over DeLuca et al. U.S. Patent No. 5,611,851 and Schmid et al. U.S. Patent No. 5,693,135. As claims 4, 7-9, 12-13, and 17-19 depend either directly or indirectly from independent claims 1 and 10, which Applicants have demonstrated hereinabove as nonobvious, these claims are likewise nonobvious. Applicants respectfully request reconsideration and withdrawal of the rejections thereof.

Claims 5, 6, 14, and 15

The Examiner has also rejected claims 5, 6, 14, and 15 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Nos. 5,611,851 and 5,693,135. Claims 5, 6, 14 and 15 have been cancelled without disclaimer of the subject matter contained therein. Therefore, these rejections have been rendered moot.



***Rejections under 35 U.S.C. § 103(a), as unpatentable over Armanini et al. and Schmid et al***

The Examiner has rejected claims 1-19 under 35 U.S.C. 103(a) as being unpatentable over Armanini U.S. Patent No. 4,192,691 and Schmid et al. U.S. Patent No. 5,693,135. Applicants respectfully traverse this rejection.

According to the Examiner, “Armanini teaches an unsupported metal oxide platey pigments derived from metal oxide coated mica pigments wherein mica is dissolved away from rutile or anatase titanium dioxide (col. 3, lines 1-51) by dispersing the pigments in a hydrofluoric-sulfuric acid solution (col. 3, lines 9-15).” See Office Action at page 5, third paragraph. The Examiner continues, “Schmid teaches a reduced titanium oxide coated mica and method of making wherein titanium dioxide is reduced in the presence hydrogen or ammonium or mixtures of the two, which can produce mass tone colors of blue and violet (col. 3, lines 1-35; Examples 1 and 2).” See Office Action page 5, fourth paragraph.

The Examiner then concludes, “[i]t would have been obvious to one of ordinary skill in the art to combine the two inventions, Armanini’s invention of unsupported metal oxide for the purpose of increasing the reflectivity and Schmid’s invention of reducing the metal oxide for the purpose of increasing the mass tone color, in order to produce an optimum optical effect pigment having increase reflectivity and deep mass tone color.” See Office Action at page 5, last paragraph.

As described hereinabove, the pigments of the present invention show an unexpected color change when compared to the pigments of the '691 and '135 patents.

Applicants have submitted with this reply the Declaration of Carmine DeLuca, a co-inventor of the present invention, under 37 C.F.R. § 1.132. The resulting color change would be unexpected in light of the teachings of the prior art (see Declaration paragraph 9), and thus, nonobvious. In addition to this unexpected result, the pigments of the present invention also show an increased optical thickness resulting in improved hiding ability. This improved characteristic in the pigments of the present invention result from the color change, and thus, were also unexpected.

Therefore, Applicants assert that the reduced unsupported pigments of the present invention contain improved characteristics, such as increased optical thickness, improved hiding, and a color change, and that these characteristics would have been unexpected in light of the teachings of the '691 and '135 patents. As such, Applicants further assert that the present invention would not have been obvious to one of ordinary skill in the art. See M.P.E.P § 716.02. Applicants respectfully request reconsideration and withdrawal of this rejection.

Claims 2-4, 7-9, 11-13, and 16-19

The Examiner has rejected claims 4, 7-9, 12-13 and 17-19 under 35 U.S.C. § 103(a) as being unpatentable over Armanini U.S. Patent No. 4,192,691 and Schmid et al. U.S. Patent No. 5,693,135. As claims 4, 7-9, 12-13, and 17-19 depend either directly or indirectly from independent claims 1 and 10, which Applicants have demonstrated

hereinabove as nonobvious, these claims are likewise nonobvious. Applicants respectfully request reconsideration of the claim and withdrawal of the rejection thereof.

Claims 5, 6, 14, and 15

The Examiner has also rejected claims 5, 6, 14, and 15 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Nos. 4,192,691 and 5,693,135. Claims 5, 6, 14 and 15 have been cancelled without disclaimer of the subject matter contained therein. Therefore, these rejections have been rendered moot.

**CONCLUSIONS**

Applicants have herewith submitted a Declaration signed by Carmine DeLuca, a co-inventor of the present invention. According to the co-inventor, the unsupported reduced pigments of the present invention show a color change when compared to the pigments of the prior art. Applicants respectfully assert that this improvement was unexpected in light of the prior art patents cited by the Examiner. As such, it is Applicants position that claims 1 and 10, as presently amended, are nonobvious, and thus, patentable. Likewise, Applicants assert that claims 2-4, 7-9, 11-13, and 16-20, which depend either directly or indirectly from claims 1 and 10 are also nonobvious. Applicants respectfully request reconsideration of the claims and withdrawal of all of the outstanding objections and rejections.

Respectfully submitted,

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Date

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